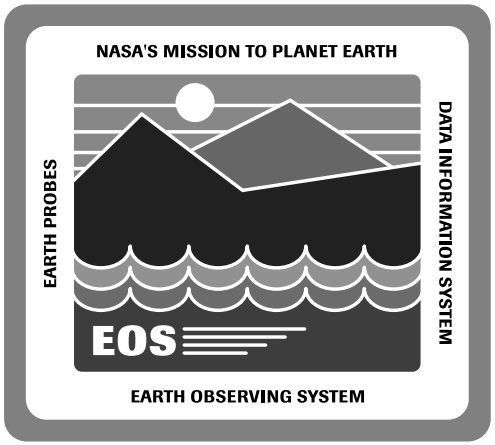


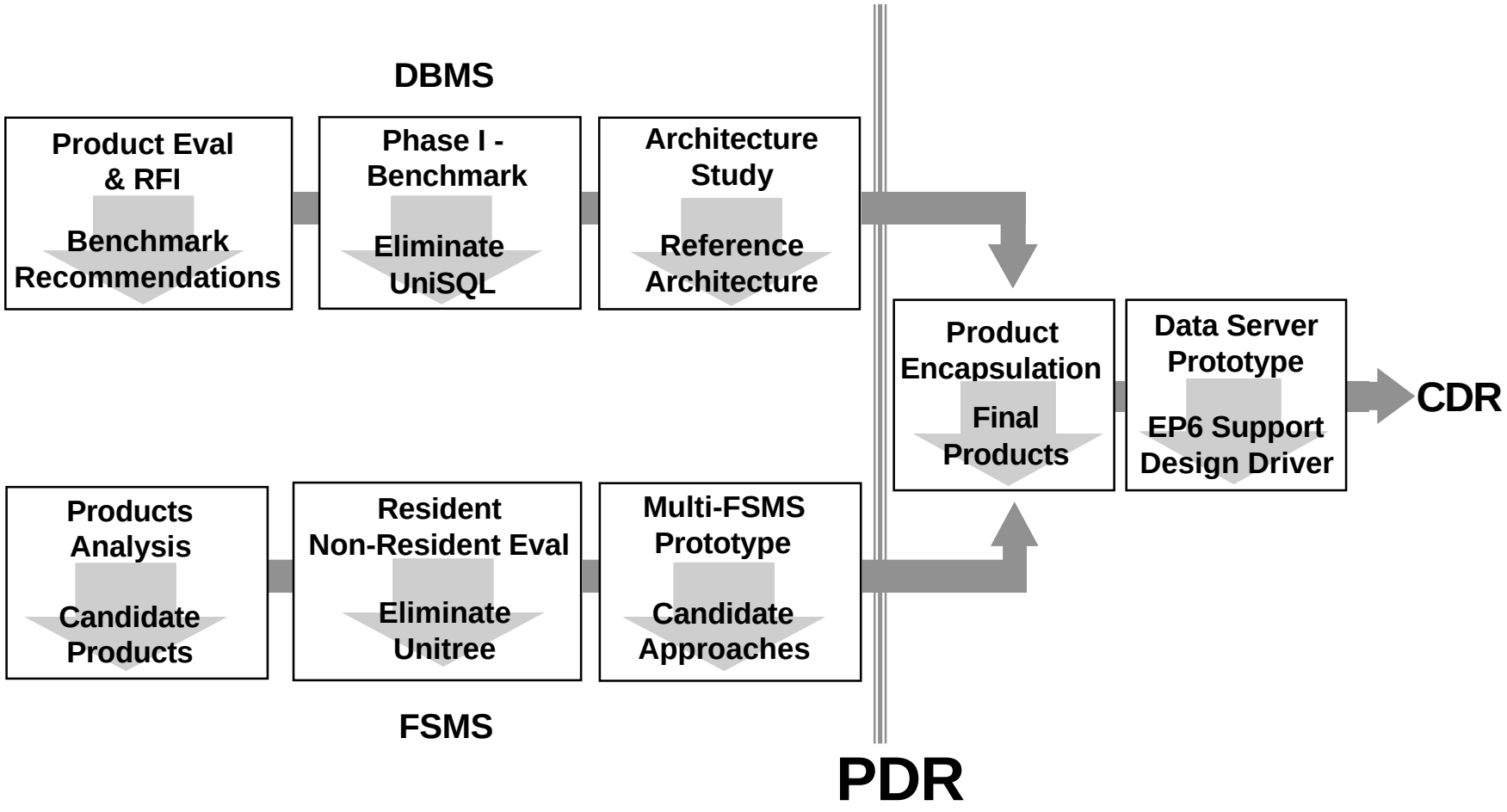
Data Server Subsystem

COTS Software Implementation

Evelyn Nakamura

14 February 1995

COTS Software Implementation Activities to Date

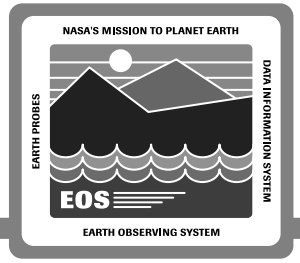


COTS Software Implementation Activities to Date

	Objective	Document	Results
DBMS Product Evaluation	Survey of DBMS technology and vendor products evaluation using key SDPS requirements	**DBMS Evaluations Technical Paper**	Vendor RFI (Request for Information) Recommendations for performance benchmark
DBMS Phase I - Performance Benchmark	Comparative performance of candidates Gain hands-on experience with each product	**DBMS Benchmark Report**	Elimination of one candidate from further consideration Recommend further evaluation is needed
DBMS Phase II - Architecture Study	Focused analysis on Data Server Requirements	**Data Server Architecture Study**	Recommendations for prototyping and evaluation leading to final selection
FSMS Products Analysis	Survey of vendor products, examine new and emerging technology	**FSMS Technology Working Paper**	Living reference document on FSMS technology
Volume Management Product Analysis	Evaluate options for large archive architectures	**Physical Access and Media Management Working Paper**	Recommendation for a scalable, evolvable archive architecture with good RMA
File Management Products Analysis	Focused analysis on file management using Data Server requirements	**FSMS Analysis Working Paper**	Recommends primary and secondary candidates for prototyping leading to final selection

Executive Summaries can be found in DID 211, "ECS Trades and Studies Document"

COTS Software Implementation Architectural Requirements



- ***"support evolvability and technology insertion"***

  Wrappers isolate use of proprietary interfaces to COTS

  CSCI design wraps subsystems

- ***"data are data"***

  Consistent interface to ESDTs independent of storage or implementation

  Stateful sessions with ESDT "servers" independent of the protocols implemented at the individual servers

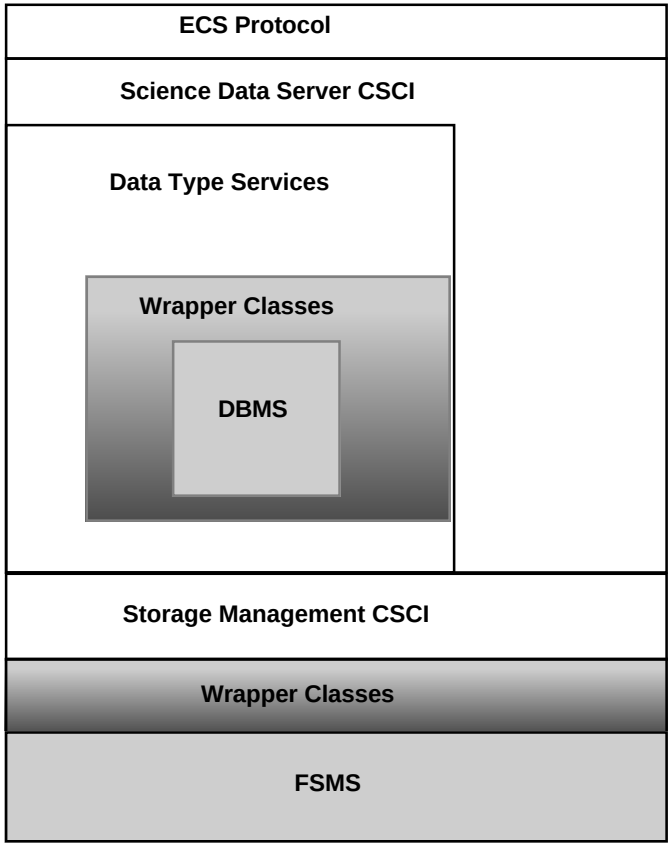
- ***"accommodate site autonomy, heterogeneity"***

  Encapsulation hides variety of storage technologies and their implementation / optimization

- ***"policy neutral"***

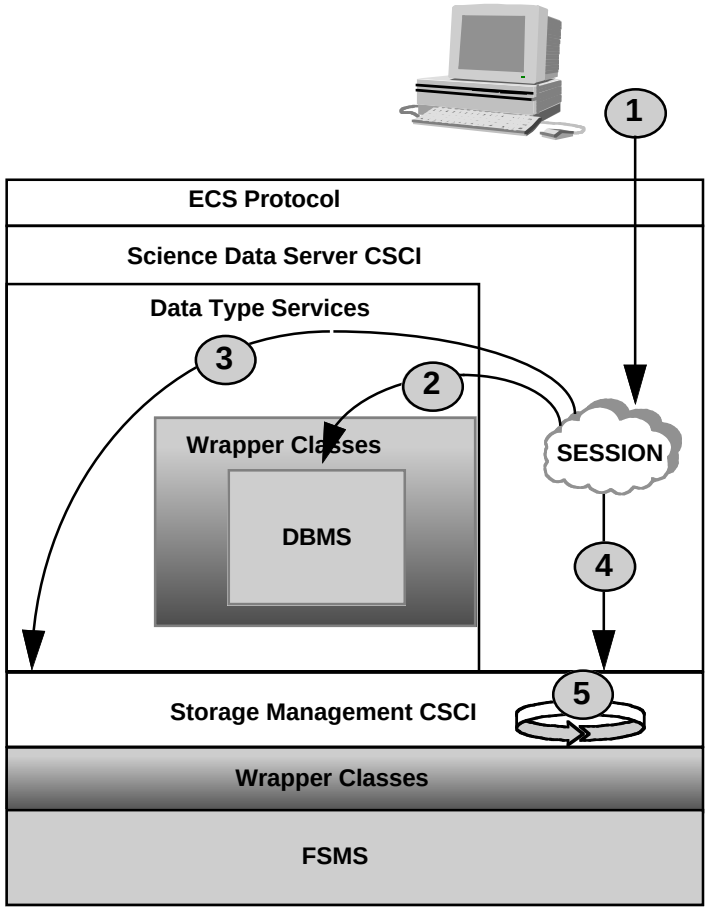
  Responsive to changes in local / global policy

COTS Software Implementation Architectural Requirements



Reference framework for incorporation of COTS in the software design

COTS Software Implementation System Scenarios I



Typical User Session

1. A client ACCESSES the Data Server within a Session. (DID 305, Fig. 7.2-9)

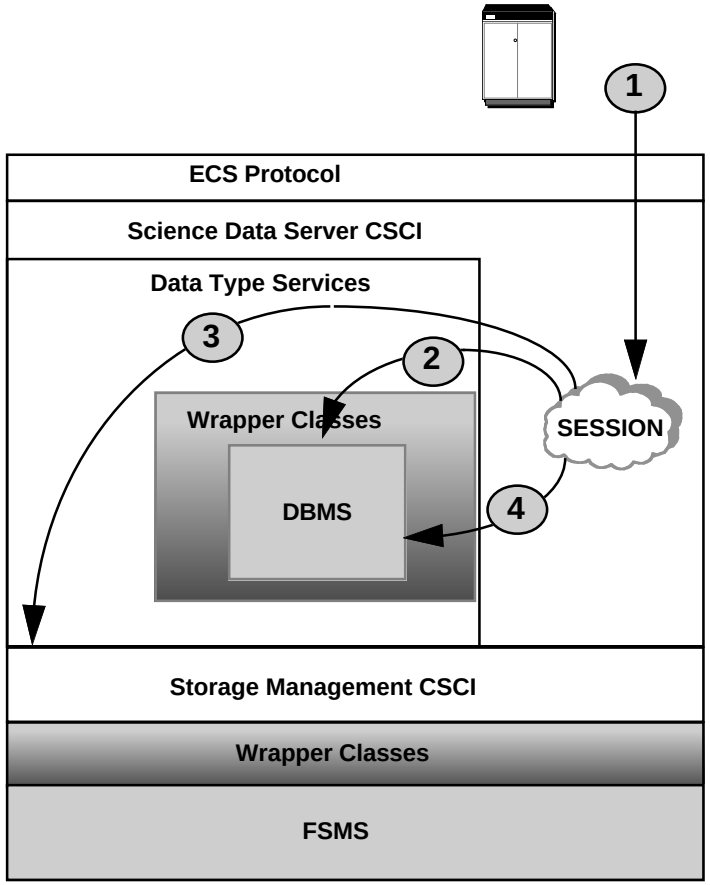
2. Client requests a SEARCH of a collection of ESDTs. (DID 305, Fig. 7.2-5)

3. Client requests BROWSE for an ESDT (DID 305, Fig. 7.2-5 & Fig. 7.5-3)

4. Client requests an electronic ACQUIRE (pull) (DID 305, Fig. 7.5-3)

5. Data is staged to User Pull Area (DID 305, Fig. 7.5-3)

COTS Software Implementation System Scenarios II



Data Insert Operation

(DID 305, Fig. 7.2-8)

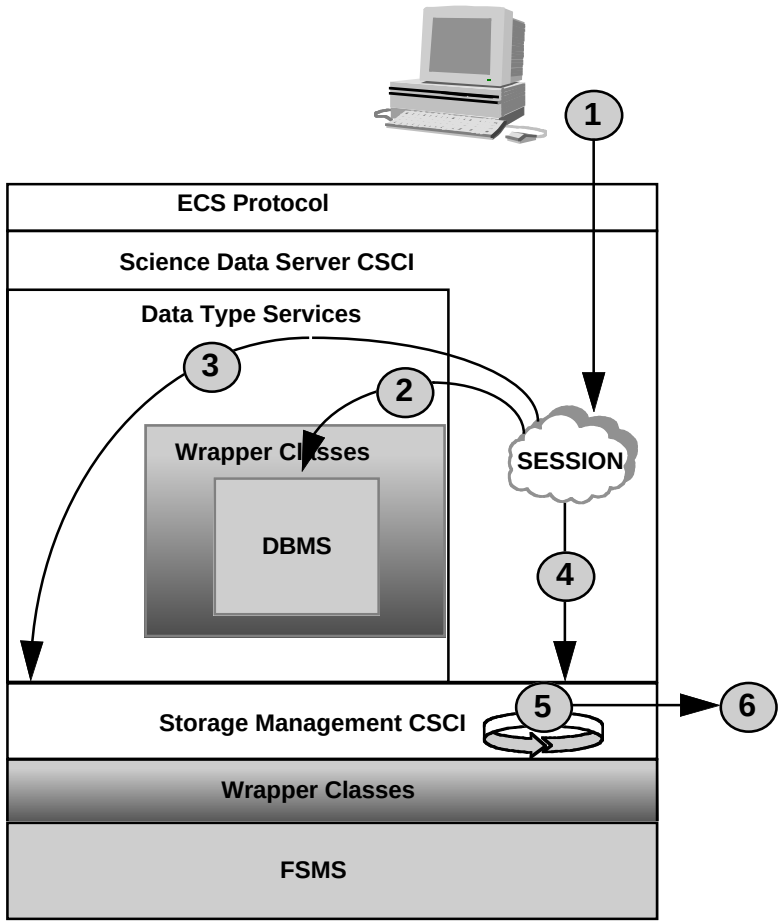
1. Data Server receives the service request to INSERT data and establishes a SESSION.

2. A new data type is instantiated and the metadata is VALIDATED.

3. The data type is INSERTED into the archive via an ARCHIVE object.

4. The database is UPDATED with the metadata for the new granule.

COTS Software Implementation System Scenarios III



Physical Media Distribution

1. A client ACCESSES the Data Server within a Session. (DID 305, Fig. 7.2-9)

2. Client requests a SEARCH of a collection of ESDTs. (DID 305, Fig. 7.2-5)

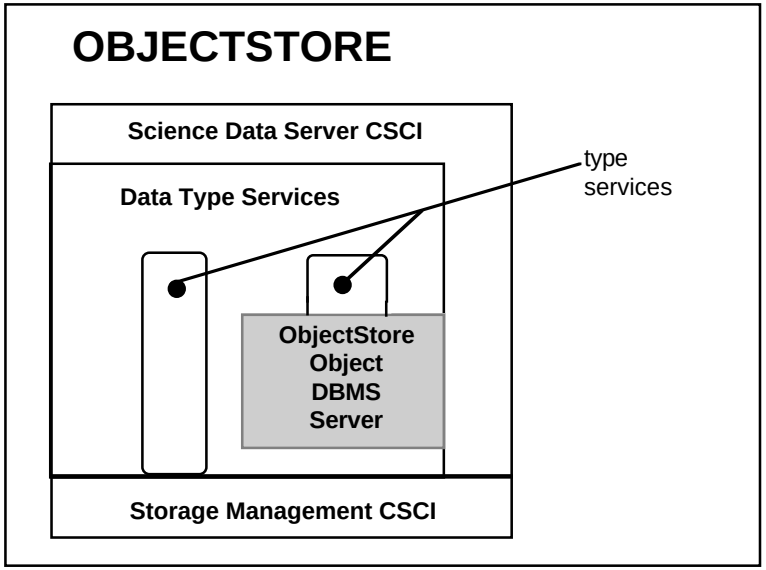
3. Client requests BROWSE for an ESDT (DID 305, Fig. 7.2-5 & Fig. 7.5-3)

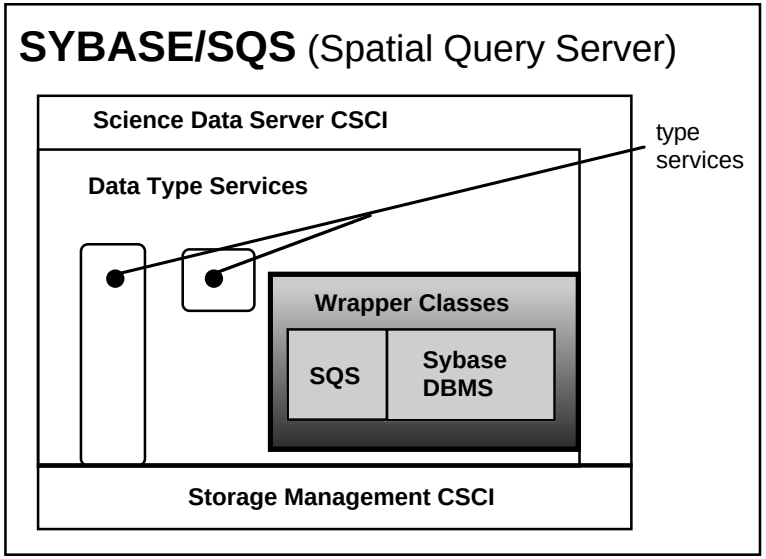
4. Client requests a PHYSICAL MEDIA DISTRIBUTION (DID 305, Fig. 7.5-5)

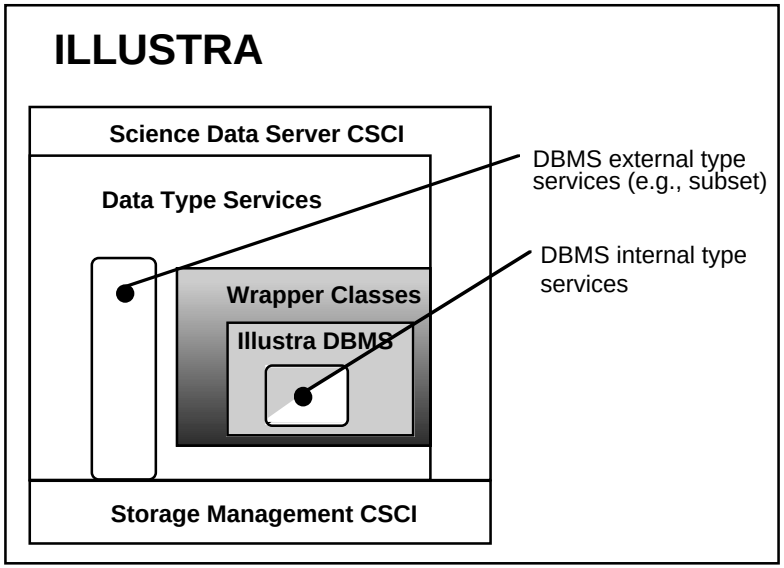
5. Data is staged to distribution area (DID 305, Fig. 7.5-5)

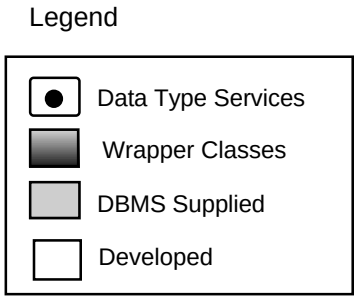
6. Distribution resource is allocated; data is externalized to requested media (DID 305, Fig. 7.5-5)

COTS Software Implementation
DBMS Approach

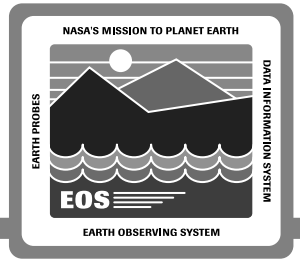








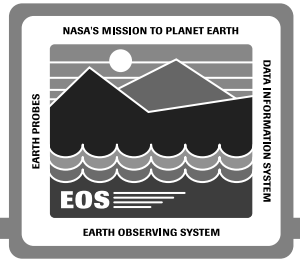
COTS Software Implementation DBMS Approach (cont.)



DBMS Evaluation and RFI
DBMS Technical Evaluation Phase I - Performance
DBMS Technical Evaluation Phase II - Non-Performance

- **Object Oriented, Object Relational, and Relational DBMS with an external spatial index.**
- **Incorporate in High Level Data Server Design**
- **Estimate Functional Coverage**
- **Assess Release A Technical Risk**
- **Investigate Fall-Back Options**
- **Evaluate Maintainability/Operability**
- **Examine Non-Technical Factors**

COTS Software Implementation FSMS Requirements



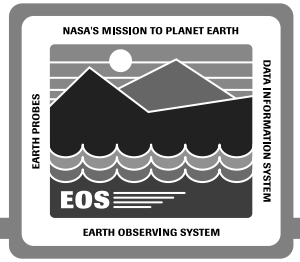
Architecture

- **File and Volume Serving Decomposition for Scalability**
  - **Reduces Monolithic Nature of FSMS**
  - **Horizontal and Vertical Scaling**
  - **Host Economies of Scale**
- **Multi-FSMS Solution to Support Heterogeneity**
  - **Accommodate Variety of FSMS Products**
  - **Exploit product diversity**
  - **Minimize Individual Product Limitations**

Functionality

- **Data Movement**
- **Archive Maintenance**
- **Access to File at Block or Record Level**

COTS Software Implementation Plan



Proceed with Encapsulation of Primary Candidates

- **Prototype Subsystem Interfaces**
- **Perform Additional Benchmarks**
- **Port Subsystems to Target Platforms**

Vendor Commitments

- **2Q95 Technical Content**
- **Non-Technical Factors**

Support Incremental Track Development

- **Prototype Workshop I Capture**
- **Data Server Prototype in EP6**